


Notice of Allowability	Application No.	Applicant(s)	
	09/859,647	DELIWALA, SHRENIK	
	Examiner	Art Unit	
	Charlie Peng	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to ____.
2. ☒ The allowed claim(s) is/are 1-31 and 33-35.
3. ☐ The drawings filed on ____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date <u>09/15/02, 09/20/02</u> . |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>02/16/02, 04/18/02, 11/01/02, 01/16/03, 01/29/03</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other ____. |

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claim 32, drawn to a computer readable medium, classified in class 369, subclass 13.24+.
- II. Claims 1-31 and 33-35, drawn to an optical lens, classified in class 385, subclass 5.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the details of the waveguide lens are not present in claim 32. The subcombination has separate utility such as multiplexer.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

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Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

During a telephone conversation with Wendy W. Koba (Reg. No. 30509) on September 15, 2004 a provisional election was made without traverse to prosecute the invention of Group II. Affirmation of this election must be made by applicant in replying this Office action. Claim 32 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Allowable Subject Matter

2. Claims 1-31 and 33-35 are allowed.

3. Claims are allowed for the following reasons:

The instant application is deemed to be a non-obvious improvement over the invention patented in U.S. Patent No. 5,444,567 to Kataoka and publication by Fowler et al. The applicant discloses in claim 1 of a waveguide-based optical lens with an input port, an output port, and a region of focusing propagation constant therebetween. The waveguide is made at least in part by an active semiconductor, and it has a first electrode on a first face but insulated from the active semiconductor and a second electrode on a first side in electrical contact with the semiconductor. When a voltage is applied to the electrodes, a 2DEG is formed within the region of focusing propagation constant and causes a change in the propagation constant, thereby changing the focal length of the waveguide, which acts as an optical lens. Kataoka teaches a similar operation where the focal length of the waveguide is changed as a result of applied

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voltage due to the change in refractive index. However, Kataoka does not teach the relationship among the applied voltage, the propagation constant, and the formation of the two-dimensional electron gas (2DEG). Furthermore, Kataoka uses a different arrangement in placing the electrodes, both of which are placed on the opposite faces of the waveguide. Fowler et al. shows an electronic device that is fabricated the same manner in placing of the electrodes and insulation parts, and Fowler is also the first to discuss the existence of 2DEG. However, Fowler's work does not in any way indicate that the electronic device can be used as or as a substitute to a waveguide-based optical device. It is this examiner's opinion that the prior art of record, taken alone or in combination, fails to disclose or render obvious in combination with the rest of the limitations of the base claim 1.

The applicant further discloses in claim 10 a controller that controls the propagation constant level as well as the focal length of the optical lens by varying the voltage applied to the electrode. The electrode has a specified shape that can be projected into the waveguide to generate a region of changing propagation constant corresponding generally in shape to the shape of the electrode. Kataoka also teaches a usage of a circular electrode to create an optical device similar to cylindrical lens within a waveguide, but not the relationship among the applied voltage, the changing propagation constant, and the variable focus. It is this examiner's opinion that the prior art of record, taken alone or in combination, fails to disclose or render obvious in combination with the rest of the limitations of the base claim.

The applicant further discloses in claim 21 a method of focusing the light transmitting through the aforementioned optical lens as described in claim 10. By virtue of claim 10 being allowed, no prior art taken alone or in combination can be used to reject this claim.

The applicant further discloses in claim 33 two features that differs from claim 1: a Field Effect Transistor (FET) portion functioning as the electrodes on the optical lens; a controller for controlling the propagation constant as well as the focusing of the optical lens. The design of the FET is different and more complex than the electrodes disclosed in claim 1. Based on this design, the addition disclosure of the controller, and by virtue of claim 1 being allowed, no prior art taken alone or in combination can be used to reject claim 33.

The applicant further discloses in claim 34 and 35 an apparatus and its method of operation based on the design of the optical lens that focuses and outputs an optical signal as well as means for generating the region of propagation constant of a specific shape and controlling the propagation constant. Kataoka again fails to teach the significance of the propagation constant, and it is this examiner's opinion that the prior art of record, taken alone or in combination, fails to disclose or render obvious in combination with the rest of the limitations of the claims 34 and 35.

Claims 2-9; 11-20; and 22-31 are allowed by virtue of their dependence upon independent claim 1, 10, and 21 respectively.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Please cancel claim 32.

In claim 3, line 2, delete "said length", and insert therein --the region of focusing propagation constant--.

This application is in condition for allowance except for the presence of claim 32 non-elected without traverse. Accordingly, claim 32 has been cancelled.

CONCLUSIONS

4. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

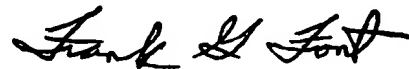
5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charlie Peng whose telephone number is (571) 272-2177. The examiner can normally be reached on 8:30 am - 5 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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6. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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